Fact Sheet: Willamette Basin Mercury TMDL

WATERBODY/WATERSHED	TMDL covers the entire Willamette River Basin (HUC 170900), approx. 14,000sq miles. *Listed Segments*: Mainstem, Coast Fork (HUC 17090002), Dorena and Cottage Grove Reservoirs *Total # of TMDLs*: 10
DATE TMDL APPROVED	Approved 9/29/06; *Lead Agency*: Oregon DEQ (ODEQ)
BASIS FOR 303(d) LISTING	Fish consumption advisories
WATER QUALITY STANDARDS TARGET & TMDL TARGET	*WQ Standard*: 0.35mg/kg fish tissue criterion for mercury (used EPA's 0.3 mg/kg fish tissue criterion to calculate TMDL target). *TMDL Target*: Interim water column guidance value is 0.92 ng/l of total Hg. TMDL target is the water column concentration required to bring Northern pikeminnow tissue concentration to 0.3mg/kg, as calculated using the Food Web Biomagnification Model.
EXISTING SOURCE LOADINGS	**Mainstem** (Total Load= 128 kg/yr)**:** *Point Sources:* **Estimated Total Point Source Load is 5.0kg/yr:** 0.8kg/yr from Mine discharges (0.6% of total loading); 3.5kg/yr from POTW discharges (2.7%); 1.5kg/yr Industrial discharges (1.2%) *No data currently available for estimating contributions from landfill emissions.* *Nonpoint Sources:* **Estimated Total Nonpoint Source Load is 123.5 kg/yr:** 53.7kg/yr from air deposition runoff (41.8%); 7.6kg/yr Direct deposition to water (5.9%); 61.4kg/yr Surface soil erosion (47.8%). **Dorena** (Total Load= 2.08 kg/yr)**:** *Point Sources*: No significant point sources *Nonpoint Sources*: **Estimated Total Nonpoint Source Load is 2.08 kg/yr**: 1.43 kg/yr (68.9%) Soil Erosion; 0.58 kg/yr (27.8%) from Air Deposition Runoff; 0.07 kg/yr (3.3%) Air Deposition Direct to Water; Legacy Mine Discharges Not Determined. **Cottage Grove** (Total Load= 3.13 kg/yr)**:** *Point Sources*: No significant point sources *Nonpoint Sources*: **Estimated Total Nonpoint Source Load is 3.13 kg/yr:** 2.33 kg/yr (74.4%) Legacy Mines; 0.22 kg/yr (7.1%) Air Deposition Runoff; 0.03 kg/yr (0.9%) Air Deposition Direct to Water; 0.55 kg/yr (17.6%) Soil Erosion. *Source categories considered in this analysis include: atmospheric deposition (local and far-field); erosion of native soils; historical mining activity; sediment resuspension; and municipal and industrial water discharges.*
METHOD FOR CHARACTERIZING EXISTING LOADINGS	*Point sources*: Data from ODEQ were combined with the available information from municipal and industrial sources to generate estimations. *Nonpoint sources*: combination of available monitoring and land use data and informed assumptions. Literature rates for soil erosion were utilized in lieu of actual monitoring data. Default values from the USEPA and emission factors (for air sources) were employed in the source characterization since little information was available on actual mercury concentrations found in effluent and stack emissions from key industrial sectors.
METHOD FOR DETERMINING ALLOWABLE LOAD (LOADING CAPACITY)	A Basin-Specific Aquatic Food Web Biomagnification Model (FWM) was used to establish a WQT of 0.92ng/l required to bring the Northern pikeminnow to the target of 0.3mg/kg. The FWM simulates mercury accumulation in fish, via a basin-specific food web, considering chemical mass balance for aquatic biota.

REDUCTIONS NEEDED TO REACH TARGET	ODEQ plans to revise estimates of the TMDL target and allocations by 2011, therefore the reductions needed to reach the target are to be considered interim values. The interim loading capacity of 94.6 kg/yr represents the total annual load of mercury (as calculated at the mouth of the Willamette River) associated with the water column guidance value concentration deemed to be protective of the beneficial use of fish consumption. The interim loading capacities for the Dorena and Cottage Grove watersheds are 1.46 and 1.01 kg/yr respectively. These annual loads were translated into surrogate measures of percent reduction necessary to attain the interim water column guidance value in: **Mainstem:** 26.4% **Dorena:** 29.8% **Cottage Grove:** 67.8%
ALLOCATIONS	**Mainstem**: Total WLA= 3.7 kg/yr: 2.6 kg/yr POTW Dischargers; 1.1 kg/yr Industrial Dischargers; Total LA= 90.1 kg/yr: 39.2 kg/yr Atmospheric Deposition Runoff; 5.5 kg/yr Direct Deposition to Water; 44.8 kg/yr Soil Erosion; 0.6 kg/yr Legacy Mines. **Dorena:** Total WLA= No significant point sources of Hg Total LA= 1.46 kg/yr: .41 kg/yr Air Deposition Runoff; .05 kg/yr Direct Deposition to Water; 1.0 kg/yr Soil Erosion. **Cottage Grove:** Total WLA= No significant point sources of Hg. Total LA= 1.01 kg/yr: 0.07 kg/yr Air Deposition Runoff; 0.01 kg/yr Direct Deposition to Water; 0.18 kg/yr Soil Erosion; 0.75 kg/yr Legacy Mine Discharges. **Sum of Allocated Loads:** 93.8 kg/yr **Reserve Capacity**: A small reserve capacity of 0.8kg/yr (0.6% of the total load) has been incorporated to allow a growing municipality or a new source to discharge effluent containing low levels of mercury. *Note:* There are no significant point sources of mercury above the Dorena and Cottage Grove Reservoirs. For this reason, the LAs for nonpoint sources are equal to the loading capacities of each of the two systems
MARGIN OF SAFETY	15% explicit MOS due to the use of EPA's 0.3 mg/kg criterion, rather than Oregon's 0.35 mg/kg criterion for fish consumption advisory. Implicit MOS by selecting a guidance value based on the pikeminnow, the most efficient bioaccumulator of mercury (TL-4 species).
REASONABLE ASSURANCE	Point sources: NPDES permits will be consistent with WLA in the TMDL. Selected NPDES permittees will be required to provide additional monitoring data and develop a mercury reduction strategy prior to issuance of the 2011 TMDL. Nonpoint sources: Mercury reduction strategies specifying BMPs will be incorporated into the TMDL Implementation Plans from Non-MS4 DMAs, Agricultural Water Quality Management Area Plans, Forest Practices Act, plans from the federal land managers, and air sectors.
IMPLEMENTATION	ODEQ plans to develop revised estimates of the TDML target and allocations by 2011 to translate into water quality based effluent limits for wastewater point sources. Mercury minimization plans will serve as the primary vehicle for implementing mercury reduction activities within the point sector. Activities presented in the Water Quality Management Plan (WQMP) will be used as a basic framework along with an Adaptive Management approach.

MONITORING	ODEQ plans to conduct three years of water quality monitoring to collect additional information on ambient mercury and methyl mercury concentrations. Additionally, ODEQ plans to use data from Mercury Deposition Network (MDN) sites, as well as monitoring data from planned point source studies, to incorporate into future iterations of the TMDL.